

REMARKS

Applicant requests favorable reconsideration and allowance of the above-identified application in view of the following remarks.

Claims 7-18 remain pending in this application. Claims 1-6 have been canceled without prejudice. Claim 7 is the sole independent claim.

Initially, Applicant would like to thank the Examiner for indicating that Claim 18 would be allowed if rewritten in independent form. Applicant has left this claim in dependent form inasmuch as Applicant believes that its base claim is allowable for the reasons set forth below.

In addition, since the December 1, 2003 Office Action is a final Office and since Applicant wishes to cite additional art, Applicant is filing herewith an RCE and an Information Disclosure Statement. Applicant respectfully requests that the Examiner consider the art cited in the Information Disclosure Statement and initial and return a copy of the accompanying Information Disclosure Citation form.

Claims 7-12 and 14-17 have been rejected under 35 U.S.C. § 102 as being anticipated by European Patent Application No. 0 902 304 (Nakai, et al.). Claim 13 has been rejected under 35 U.S.C. § 103 as being unpatentable over Nakai, et al. in view of U.S. Patent No. 5,995,279 (Ogino, et al.).

In response, Applicant submits that independent Claim 7 is allowable over the Nakai, et al. patent for the following reasons. As recited in independent Claim 7, Applicant's invention is directed to a diffraction optical element in which a plurality of diffraction gratings are laminated. A first diffraction grating is formed with a material of a predetermined dispersion,

and an imaginary surface including tips of grating portions of the first diffraction grating is a curved surface. A second diffraction grating is formed with a material of a dispersion different from that of the first diffraction grating, and an imaginary surface including tips of grating portions of the second diffraction grating is also a curved surface. The second diffraction grating is arranged such that there is an interval between the first diffraction grating and the second diffraction grating. In addition, the pitches at positions of tips of corresponding grating portions of the first and second diffraction gratings are equal over the area of use.

This arrangement solves a problem that arises in diffraction optical elements in which an imaginary surface including tips of grating portions of first and second diffraction gratings is a curved surface. In such a structure, if the pitches at the positions of tips of corresponding grating portions of the first and second gratings are not equal over the area of use, as shown in Figure 4, light that enters a first portion of the first grating (portion 6-1 in Figure 4) does not enter a corresponding portion (portion 7-1) of the second grating. As a result, diffracted light of the design order is not generated, and unnecessary diffracted light is produced, as discussed at page 18, line 10 through page 20, line 8. The present invention solves this problem by making the positions of tips of corresponding grating portions of the first and second diffraction gratings equal over the area of use, thereby reducing the generation of unnecessary diffraction light.

In contrast, the patent to Nakai, et al. is not understood to disclose or suggest an embodiment in which the imaginary surfaces including tips of grating portions of first and second diffraction gratings are curved surfaces, and in which the pitches at positions of tips of corresponding grating portions of the first and second diffraction gratings are equal over the area of use, as recited by independent Claim 7.

The Office Action cites column 9, lines 9-11 and column 14, lines 37-40 of the patent to Nakai, et al. to disclose that “an imaginary surface including tips of grating portions of said first diffraction gratings is a curved surface” and column 11, lines 1-11 and column 14, lines 37-40 to disclose “an imaginary surface including tips of grating portions of said second diffraction grating is a curved surface”. And the Office Action cites Figures 5 and 6D to disclose that “the pitches of corresponding grating portions of said first and second diffraction grating are equal over the range of use”. But these two different features of the Nakai, et al. patent are understood to be disclosed in different embodiments and the Nakai, et al. patent is not understood to disclose these two features in a single embodiment. More specifically, the feature involving the imaginary curved surface is understood to be disclosed to occur in the first embodiment (as discussed at column 9, lines 7-9) and the third embodiment (as discussed at 14, lines 35-40), while the equal-pitch feature is understood to be disclosed in the second embodiment (Figures 5 and 6 relate to the second embodiment, as discussed at column 12, line 37 through column 13, line 3).

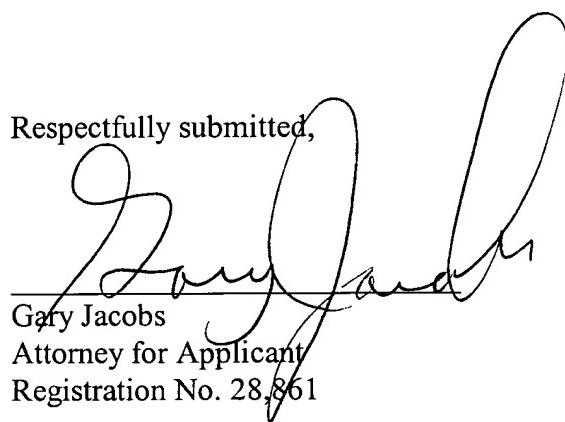
Therefore, the Nakai, et al. patent is not understood to disclose an embodiment in which the imaginary surfaces including tips of grating portions of first and second diffraction gratings are curved surfaces, and in which the pitches at positions of tips of corresponding grating portions of the first and second diffraction gratings are equal over the area of use, as recited by independent Claim 7. For this reason, Claim 7 is allowable over this patent.

For the foregoing reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 7 under 35 U.S.C. § 102. And since the remaining claims are dependent from Claim 7, and recite features that are patentable in their own right, Applicant also requests reconsideration and withdrawal of the rejection of the dependent claims.

In view of the above amendments and remarks, the claims are now in allowable form. Therefore, early passage to issue is respectfully solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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